



Software innovations developed under Ames Research Center's SBIR program include two helicopter codes developed by Continuum Dynamics, Inc. (CDI), Princeton, New Jersey.

One is EHPIC (*Evaluation of Hover Performance Using Influence Coefficients*), a program used in helicopter design to predict the engine power required for a helicopter to hover. Such prediction is important, but difficult. The primary complication is calculating the effect of the wake of disturbed air trailed by a rotor blade on its neighboring blade (**left**). The EHPIC free wake model produces converged, freely distorted wake geometries that generate very accurate analysis of wake-induced downwash; this, in turn, allows good predictions of rotor thrust and power requirements. CDI has licensed the EHPIC code to three of the four major U.S. rotorcraft manufacturers.

A second CDI product is RotorCRAFT, a program for analysis of aerodynamic loading of helicopter blades in forward flight, a major concern in helicopter design. In particular, an accurate model of unsteady aerodynamic loading is required to understand and alleviate the sources of vibration in helicopters. Using some of the wake modeling tools developed for EHPIC, CDI developed the RotorCRAFT code, which has demonstrated good correlation of measured rotor airloads, an important part of vibration prediction. The code has been licensed to Sikorsky Aircraft Division of United Technologies. •

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